

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte YUJI UEDA, NAOKI TAKEYAMA,
HIROMI UEKI and TAKEHIRO KUSUMOTO

Appeal No. 95-4663
Application 08/044,487¹

HEARD: March 2, 1998

Before JOHN D. SMITH, GARRIS and PAK, Administrative Patent Judges.

JOHN D. SMITH, Administrative Patent Judge.

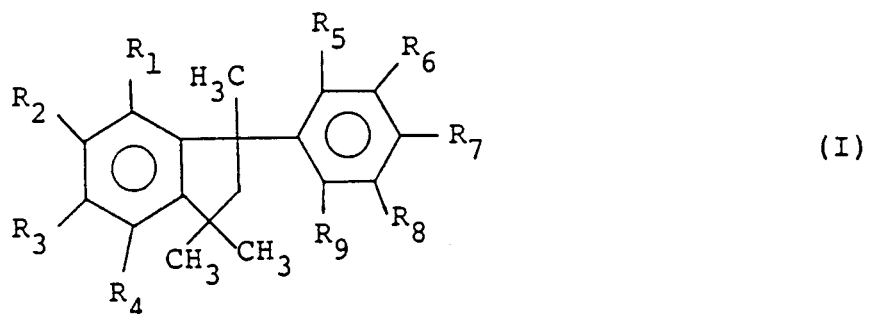
DECISION ON APPEAL

This is an appeal pursuant to 35 USC § 134 from the final rejection of claims 1 through 13.

Claim 1 is representative and is reproduced below:

¹ Application for patent filed April 9, 1993.

1. A positive photoresist composition comprising an alkali-soluble resin, a dissolution inhibitor and a photo-induced acid precursor, wherein said alkali-soluble resin is obtainable through a condensation reaction of a phenol compound including a compound represented by the following general formula (I):



wherein R_1 to R_9 , independently of one another each represent a hydrogen atom, a halogen atom, an optionally substituted straight chain or branched chain alkyl or alkenyl group, a -OH group or an optionally substituted alkylcarbonyl group, provided that at least one of R_1 to R_9 is -OH group and at least two hydrogen atoms are attached to the o- or p-position of the -OH group, and an aldehyde component.

Appeal No. 95-4663
Application 08/044,487

The references of record relied upon by the examiner are:

Renner	4,371,605	Feb. 1, 1983
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Uetani et al. (Uetani) 0 460 416 A1 Dec. 11, 1991
(European Patent)

Lamola et al. (Lamola), Solid State Technology, "Chemically Amplified Resists", No. 8, pages 53-60 (1991).

The appealed claims stand rejected for obviousness (35 USC § 103) over Uetani in view of Lamola and Renner.

We reverse.

The subject matter on appeal is directed to a chemically amplified² positive photoresist composition useful in deep ultraviolet lithography which composition includes an alkali-soluble resin (referred to as a novolak resin), a dissolution inhibitor and a photo-induced acid precursor. The alkali-soluble novolak resin is produced through a condensation reaction of an aldehyde with a phenol compound, including a compound of general

² The phrase "chemically amplified resist" is a coined term which has been defined as a resist material in which exposure, followed by a post exposure bake, results in the formation of a catalytic photoproduct, the three-dimensional distribution of which defines the latent image. See page 54, the first full paragraph of Lamola.

formula (I) as set forth in appealed claim 1. The positive photoresist composition of the present invention is said to exhibit advantageous resolution, profile and sensitivity properties.

The examiner's prima facie case of obviousness is predicated on the contention that it would have been obvious to a person of ordinary skill in the art to modify the photoresist composition taught by Uetani by using the dissolution inhibitor taught by Lamola and the photoinduced acid precursor taught by Renner to produce a positive photoresist composition, because each component is used for its intended purpose and one would expect that ?known components used in positive photoresists compositions would perform in known and expected manners?. See the Answer at pages 3 and 4. In support of this rejection the examiner correctly factually determined that Uetani teaches a positive photoresist composition containing an alkali soluble novolak resin which is identical to the claimed alkali-soluble resin (i.e., an alkali-soluble resin obtained through a condensation reaction of an aldehyde with a phenol compound including a compound of general formula (I) as recited in claim 1). However, a quinone diazide compound is also an essential component of the radiation-sensitive composition disclosed by Uetani. See Uetani

at page 2, line 56 to page 3, line 27. Thus Uetani's composition may be characterized as a positive-tone resist containing a diazonaphthoquinone photoactive component (PAC) in combination with a novolak resin which is referred to in the prior art as a "PAC/novolak resist". See Lamola at page 53, column 1, first full paragraph.

Lamola describes a three component positive photoresist, much like the photoresist claimed herein, which contains an alkali soluble resin, a dissolution inhibitor and a photo-induced acid precursor. See page 55 of Lamola. However, with respect to the alkali soluble resin, Lamola indicates (page 55, second column, last paragraph) that it is not a "coincidence" that all examples described of chemically amplified resist are based on phenolic polymers rather than novolak resins. In fact, Lamola indicates that while novolak resins with improved transparency have been developed for such systems, the transparency improvement is not adequate and the high nonbleachable absorption properties precludes the use of such novolaks in certain systems. See page 56, first full paragraph of the reference. Lamola also expressly indicates that the chemically amplified resists described are useful for deep ultraviolet lithography. However,

with respect to a PAC/novolak resists, Lamola indicates that the chemistry for the deep ultraviolet lithography systems is quite different. As set forth at page 57 of Lamola, chemically amplified resists as described therein "are no more difficult to process than PAC/novolak resists; they are simply different."

In light of the above, appellants argue, and we agree, that it is logically inconsistent to assert that one of ordinary skill in this art would modify Uetani's positive photoresist composition by using the dissolution inhibitor generally described by Lamola. Alternatively, if one looks at Lamola as the "primary reference", Lamola "teaches away" from the use of the alkali-soluble novolak resins such as the specific novolak resin described by Uetani. Since we find no disclosure in Renner which remedies the basic deficiencies in the stated rejection, we are constrained to reverse the rejection.

For the reasons stated above, we agree with appellant that a prima facie case of obviousness has not been established for the subject matter defined by the claims on appeal based on the relied upon references. This being the case, we do not find it necessary to further consider the comparative data of record found at pages 23 through 27 of the present specification.

Appeal No. 95-4663
Application 08/044,487

The decision of the examiner is reversed.

REVERSED

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JOHN D. SMITH)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
BRADLEY R. GARRIS)	
Administrative Patent Judge)	APPEALS AND
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)	INTERFERENCES
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CHUNG K. PAK)	
Administrative Patent Judge)	

Appeal No. 95-4663
Application 08/044,487

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